What is claimed is:

1. A processing apparatus, comprising:

a transfer chamber;

a plurality of processing chambers for processing therein a substrate to be processed, the processing chambers being coupled to the transfer chamber;

a number of electrostatic chucks which are provided in the processing chambers, to electrostatically adsorb the substrate to be processed thereto;

a transfer mechanism installed in the transfer chamber to transfer the substrate to be processed between the processing chambers and the transfer chamber; and

a monatomic nitrogen atom supply unit for supplying dissociated monatomic nitrogen atoms into the processing chambers.

2. A processing apparatus, comprising:

a transfer chamber;

a first processing chamber coupled to the transfer chamber, the first processing chamber performing therein a first process on a substrate to be processed;

a second processing chamber coupled to the transfer chamber, the second processing chamber performing therein a second process on the substrate to be processed;

a transfer mechanism installed in the transfer chamber for

sequentially transferring the substrate to be processed into the first and second processing chamber;

electrostatic chucks provided in the first and the second processing chambers, the electrostatic chucks electrostatically adsorbing thereto the substrate to be processed; and

a monatomic nitrogen atom supply unit for supplying dissociated monatomic nitrogen atoms into the first and second processing chamber.

3. The processing apparatus of claim 1, wherein the monatomic nitrogen atom supply unit supplies the dissociated monatomic nitrogen atoms to a close proximity of the electrostatic chucks.

4. The processing apparatus of claim 2, wherein the monatomic nitrogen atom supply unit supplies the dissociated monatomic nitrogen atoms to a close proximity of the electrostatic chucks.

5. The processing apparatus of claim 2, wherein the monatomic nitrogen atom supply unit supplies the dissociated monatomic nitrogen atoms into the transfer chamber.

6. The processing apparatus of claim 2, further comprising a controller for controlling a supply timing of the dissociated monatomic nitrogen atoms from the monatomic nitrogen atom supply unit.

7. The processing apparatus of claim 2, wherein the monatomic nitrogen atom supply unit includes a pipe communicating with the processing chambers, an N_2 gas supply source for supplying an N_2 gas through the pipe, and an energy supply unit for applying energy to the N_2 gas in the pipe or in the processing chambers to convert the N_2 gas into the dissociated monatomic nitrogen atoms.

8. The processing apparatus of claim 6, wherein the energy supply unit has an ultraviolet irradiation unit for irradiating ultraviolet ray to the N_2 gas.

9. The processing apparatus of claim 6, wherein the pipe has a dielectric portion, and the energy supply unit has an induction coil wound around the dielectric portion and a high frequency power supply for applying a high frequency to the induction coil.

10. The processing apparatus of claims 6, wherein the energy supply unit applies energy which is higher than the dissociation energy of the N_2 gas and lower than the ionization energy of the N_2 gas, to the N_2 gas.

11. A processing method employing a processing apparatus, which includes a transfer chamber, a plurality of processing chambers coupled to the transfer chamber, to process therein a target substrate, and a number of electrostatic chucks provided in the

processing chambers to electrostatically adsorb the target substrate thereto, comprising the steps of:

transferring the target substrate from the transfer chamber into one of the processing chambers by using a transfer mechanism;

placing the target substrate on an electrostatic chuck displaced in said one processing chamber;

applying a direct current to an electrode embedded in the electrostatic chuck to electrostatically absorb the target substrate to the electrostatic chuck;

processing the target substrate in said one processing chamber, to thereby obtain a processed substrate;

terminating the application of the direct current to the electrostatic chuck;

supplying dissociated monatomic nitrogen atoms into said one processing chamber to remove charge on the electrostatic chuck; and

transferring the processed substrate into the transfer chamber using the transfer mechanism.

12. The processing method of claim 11, wherein the dissociated monatomic nitrogen atoms are supplied near the electrostatic chucks.

13. A processing method using a processing apparatus, which includes a transfer chamber, a first processing chamber coupled

to the transfer chamber, for performing a first process on a target substrate therein, a second processing chamber coupled to the transfer chamber for performing a second process on the target substrate therein, and a first and second electrostatic chucks provided in the first and second processing chambers, respectively, to electrostatically adsorb the substrate thereto, comprising the steps of:

transferring the target substrate from the transfer chamber into the first processing chamber using a transfer mechanism;

placing the target substrate on the first electrostatic chuck in the first processing chamber;

applying a direct current to an electrode of the first electrostatic chuck to electrostatically adsorb the target substrate to the first electrostatic chuck;

performing a first process on the target substrate in the first processing chamber to thereby obtain a processed substrate;

terminating the application of the direct current to the first electrostatic chuck;

supplying dissociated monatomic nitrogen atoms into the first processing chamber to remove charge on the first electrostatic chuck;

transferring the processed substrate into the transfer chamber using the transfer mechanism;

transferring the processed substrate from the transfer chamber into the second processing chamber;

placing the processed substrate on the second electrostatic chuck in the second processing chamber;

applying the direct current to an electrode of the second electrostatic chuck to electrostatically adsorb the processed substrate to the second electrostatic chuck; and

performing a second process on the processed substrate in the processed second processing chamber.

14. The processing method of claim 13, wherein the dissociated monatomic nitrogen atoms are supplied near the electrostatic chucks.

15. The processing method of claim 13, further comprising the step of supplying the dissociated monatomic nitrogen atoms into the transfer chamber.

16. The processing method of claim 13, wherein the dissociated monatomic nitrogen atoms are produced by irradiating ultraviolet ray onto N_2 gas.

17. The processing method of claim 13, wherein the dissociated monatomic nitrogen atoms are produced by applying energy, generated during application of a high frequency power to an induction coil, onto N_2 gas.

18. The processing method of claim 13, wherein the dissociated

monatomic nitrogen atoms are produced by applying energy, higher than dissociation energy of N_2 and lower than ionization energy of N_2, to the N_2 gas. 12. The processing method of claim 10, wherein the dissociated monatomic nitrogen atoms are supplied near the electrostatic chucks.

19. A processing apparatus, comprising:

a processing chamber for processing therein a substrate to be processed;

an electrostatic chuck installed in the processing chamber, for adsorbing the substrate to be process thereto; and

a monatomic N atom supply unit for supplying dissociated monoatomic N atoms into the processing chamber.

20. A processing method employing a processing apparatus, which includes a processing chamber for processing a substrate to be processed and an electrostatic chuck for adsorbing the substrate to be process thereto, comprising the steps of:

mounting the substrate to be processed on the electrostatic chuck disposed in the processing chamber; and

supplying dissociated monatomic N atoms into the processing chamber.